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CHRONIC ARSENIC EXPOSURE AND ADVERSE HEALTH OUTCOME: UNDERSTANDING THE MOLECULAR PERSPECTIVES

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Chronic arsenic toxicity and its adverse health outcome including cancer (multiple target organs) is a well established fact; however the underlying molecular mechanism of this non-mutagenic carcinogen is not well understood so far. Population chronically exposed to arsenic, either through groundwater, food stuff or occupational sources, results in a plethora of dermatological and non-dermatological health effects including multi-organ cancer and early mortality. Epidemiological studies identified males are more affected; however risk of women and child were overlooked to some extent. Skin lesions are hallmarks of arsenic toxicity and pre-malignant lesions like palmar and planter keratosis later develop into skin cancer. To understand the adverse effect of this toxic metabolite on biological system (cellular targets) and to unravel the underlying molecular basis (at the level of transcript, proteome, or metabolite) a holistic, systems biology approach was taken; where we assessed the arsenic exposure in the patients sample (blood, urine, nail, hair), identified biomarkers (cellular, genetic as well as epigenetic) and correlated with altered functioning of system (cardiovascular, respiratory, peripheral neuropathy, etc). It has been noticed, two individuals of same family member, might have different disease outcome despite of exposure at similar extent, indicating variation in individual genomic landscape and consequent interaction with environment. We have identified alterations in gene expression profile and epigenetic dysregulations (including altered DNA methylation, histone code error and miRNA dysregulation) specifically for "arsenic signature" and "lesion signature" patterns. These patterns can be used as potential prognostic biomarkers of arsenic toxicity. Moreover, we are investigating the anti-carcinogenic and epigenetic potential of black tea on arsenic-induced cancer cell line, which could be promising as epigenetic therapeutics in the field of arsenicosis.

Biography

Pritha Bhattacharjee is an Assistant Professor presently working in University of Calcutta, India. Her research interest includes Environmental Toxicogenomics, Molecular Biology and Human Genetics. She published many research articles in reputed scientific journals.

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